

CLAIMS

1. An integral ceramic filter assembly (9) produced by adhering with a ceramic seal layer (15) outer surfaces of a plurality of filters (F1), each of which is formed from a sintered porous ceramic body, the ceramic filter assembly being characterized in that:

the seal layer (15) has a thickness (t1) of 0.3mm to 3mm and a thermal conductance of 0.1W/mK to 10W/mk.

2. The ceramic filter assembly according to claim 1, wherein the seal layer includes 70wt% or less of ceramic fiber as a solid.

3. The ceramic filter assembly according to claim 1 or 2, wherein the seal layer includes ceramic fibers having fiber lengths of 100mm or less.

4. The ceramic filter assembly according to any one of claims 1 to 3, wherein the seal layer includes as a solid 3wt% to 80wt% of an inorganic grain.

5. An integral ceramic filter assembly (29) produced by adhering with a ceramic seal layer (15) outer surfaces of a plurality of elongated polygonal honeycomb filters (F1), each of which is formed from a sintered porous ceramic body, the ceramic filter assembly being characterized by:

round surfaces (18) defined on chamfered corners of the outer surface of each honeycomb filter, wherein the round surfaces have a curvature R of 0.3 to 2.5.

6. An integral ceramic filter assembly (39) produced by adhering with a ceramic seal layer (15) outer surfaces of

a plurality of filters (F1), each of which is formed from a sintered porous ceramic body, the ceramic filter assembly being characterized by:

5 a ceramic smoothing layer (16) applied to the outer surface of the assembly, which as a whole has a generally circular cross-section or generally oval cross-section.

10 7. The ceramic filter assembly according to claim 6, wherein the smoothing layer has a thickness of 0.1mm to 10mm.

8. The ceramic filter assembly according to claim 6 or 8, wherein the seal layer is thinner than the smoothing layer.

15 9. The ceramic filter assembly according to any one of claims 6 to 8, wherein the smoothing layer is made from the same material as the seal layer.

20 10. An integral ceramic filter assembly (49) produced by adhering with a ceramic seal layer (15) outer surfaces of a plurality of elongated honeycomb filters (F100), each of which is formed from a sintered porous ceramic body, the ceramic filter assembly being characterized in that:

25 a ratio L/S between a filter length L in a flow direction of a processed fluid and a filter cross-section S in a direction perpendicular to the flow direction is 0.06mm/mm² to 0.75mm/mm².

30 11. The ceramic filter assembly according to any one of claims 1 to 10, wherein the assembly is a diesel particulate filter.

12. The ceramic filter assembly according to any one

of claims 1 to 11, wherein the filter is formed from a sintered porous silicon carbide body.

13. The ceramic filter assembly according to any one
5 of claims 1 to 12, wherein the seal layer includes at least an inorganic fiber, an inorganic binder, an organic binder, and an inorganic grain and is formed from an elastic material obtained by bonding the inorganic fiber, which are
10 three-dimensionally interlinked, and the inorganic grain with the inorganic binder and the organic binder.

14. The ceramic filter assembly according to any one
of claims 1 to 13, wherein the seal layer is formed from
10wt% to 70wt% of silica-alumina ceramic fiber as a solid,
15 1wt% to 30wt% of silica sol, 0.1wt% to 5.0wt% of carboxymethyl cellulose, and 3wt% to 80wt% of silicon carbide powder.

15. The ceramic filter assembly according to any one
20 of claims 1 to 14, wherein the filters are arranged in a state offset from one another in a filter axial direction.

16. An integral honeycomb filter assembly (521)
produced by adhering with a ceramic seal layer (522) outer
25 surfaces of a plurality of honeycomb filters (523), each of which has a plurality of cells defined by a cell wall (13) and which purifies fluid including particulates with the cell wall, the honeycomb filter assembly being characterized
in that:

30 a specific surface area of grains forming the cell wall is $0.1\text{m}^2/\text{g}$ or more.

17. An elongated honeycomb filter (F100) formed from a

sintered porous ceramic body, the honeycomb filter being characterized in that:

5 a ratio L/S between a filter length L in a flow direction of a processed fluid and a filter cross-section S in a direction perpendicular to the flow direction is $0.06\text{mm}/\text{mm}^2$ to $0.75\text{mm}/\text{mm}^2$.

10 18. A honeycomb filter (F100) formed from a sintered porous ceramic body, the honeycomb filter being characterized in that:

an average pore diameter of the honeycomb filter is 5 to $15\mu\text{m}$, an average porosity is 30 to 50%, and the honeycomb filter has 20% or more of through pores.

15 19. The honeycomb filter according to claim 18, wherein the average pore diameter is 8 to $12\mu\text{m}$, the average porosity is 35 to 49%, and the ratio of through pores is 20 to 50%.

20 20. The honeycomb filter according to claim 18 or 19 comprising a plurality of cells including a first cell having a first end surface sealed by a sealing body (14) and a second cell adjacent to the first cell by way of a cell wall and having a second end surface opposite to the first end surface sealed by a sealing body, wherein the cell
25 number per square inch is 120 or more, and the thickness of the cell wall defining the cells is 0.46mm or less.

30 21. A honeycomb filter (59) having a plurality of cells defined by a cell wall (13) and purifying fluid including particulates with the cell wall, the honeycomb filter being characterized in that:

a specific surface area of grains forming the cell wall

is 0.1m²/g or more.

22. The honeycomb filter according to claim 21,
wherein the cell wall is formed from a sintered silicon
carbide body.

23. The honeycomb filter according to claim 21 or 22,
wherein the cell wall is formed from a porous body.

24. An exhaust gas purification apparatus including a
honeycomb filter (59) formed from a sintered porous ceramic
body and arranged in a casing (8) that is located in an
exhaust gas passage of an internal combustion engine (2) to
eliminate particulates included in exhaust gas, the exhaust
gas purification apparatus being characterized in that:

an average pore diameter of the honeycomb filter is 5
to 15μm, an average porosity is 30 to 40%, and the honeycomb
filter has 20% or more of through pores.

25. The exhaust gas purification apparatus according
to claim 24, wherein the average pore diameter of the
honeycomb filter is 8 to 12μm, the average porosity is 35 to
49%, and the honeycomb filter has 20 to 50% or more of
through pores.

26. The exhaust gas purification apparatus according
to claim 24 or 25 comprising a plurality of cells including
a first cell having a first end surface sealed by a sealing
body (14) and a second cell adjacent to the first cell by
way of a cell wall and having a second end surface opposite
to the first end surface sealed by a sealing body, wherein
the cell number per square inch is 120 or more, and the
thickness of the cell wall defining the cells is 0.46mm or

less.

27. The exhaust gas purification apparatus according
to any one of claims 24 to 26, wherein the total volume of
5 the honeycomb filter is $1/4$ to 2 times the total
displacement of the internal combustion engine.